What is claimed is:

1. A heat transfer fluid mixture consisting essentially of at least one light gas and at least one heavy gas, each of the at least one heavy gases having molecular weight at least two times that of each of the at least one light gas.

2. The heat transfer fluid mixture of claim 1 wherein the at least one light gas has a molecular weight less than 10, and the at least one heavy gas has a molecular weight of 10 or greater.

3. The heat transfer fluid mixture of claim 1 wherein the at least one light gas is hydrogen and the at least one heavy gas is helium.

4. The heat transfer fluid mixture of claim 1 wherein the at least one light gas is selected from the group consisting of hydrogen, helium, and mixtures thereof.

5. The heat transfer fluid mixture of claim 1 wherein the at least one light gas is hydrogen and the at least one heavy gas is selected from the group consisting of helium, any single fluid heavier than helium, and any mixture thereof.

6. The heat transfer fluid mixture of claim 1 wherein the at least one light gas is selected from the group consisting of hydrogen, helium, and any mixture thereof, and the heavy gas is selected from the group consisting of argon, any single fluid heavier than helium, and any mixture of fluids heavier than helium.

7. The heat transfer fluid mixture of claim 1 wherein the at least one light gas has a concentration ranging from about 1 mole percent to about 99 mole percent.

8. The heat transfer fluid mixture of claim 1 wherein the at least one light gas has a concentration ranging from about 30 mole percent to about 98 mole percent.

9. The heat transfer fluid mixture of claim 1 wherein the at least one light gas has a concentration ranging from about 40 mole percent to about 97 mole percent.

10. The heat transfer fluid mixture of claim 1 wherein the at least one light gas has a concentration ranging from about 50 mole percent to about 96 mole percent.

11. The heat transfer fluid mixture of claim 1 wherein the at least one light gas has a concentration ranging from about 60 mole percent to about 95 mole percent.

12. The heat transfer fluid mixture of claim 1 wherein the at least one heavy gas is selected from the group consisting of CCl_3F, CCl_2F_2, $CClF_3$, $CBrF_3$, CF_4, $CHCl_2F$, $CHClF_2$, CHF_3, $C_2Cl_4F_2$, $C_2Cl_3F_3$, $C_2Cl_2F_4$, $C_2Br_2F_4$, C_2ClF_5, C_2F_6, $C_2H_4F_2$, $C_2H_2F_4$ and mixtures thereof.

13. The heat transfer fluid mixture of claim 1 wherein the at least one heavy gas is selected from the group consisting of N_2, O_2, F_2, Ne, Cl_2, Ar, Br_2, Kr, Xe, and Rn.

14. The heat transfer fluid mixture of claim 1 wherein the at least one heavy gas is selected from the group consisting of CH_4, C_2H_4, C_2H_6, C_3H_8, C_3H_6, C_4H_{10}, $(CH_3)_3CH$, NH_3, CO, CO_2, CCl_4, CH_3Cl, SO_2, SO_3, NO, NO_2, N_2O, and mixtures thereof.

15. The heat transfer fluid mixture of claim 1 wherein the at least one heavy gas is selected from the group consisting of N_2, O_2, F_2, Ne, Cl_2, Ar, Br_2, Kr, Xe, Rn, CH_4, C_2H_4, C_2H_6, C_3H_8, C_3H_6, C_4H_{10}, $(CH_3)_3CH$, NH_3, CO, CO_2, CCl_4, CH_3Cl, SO_2, SO_3, NO, NO_2, N_2O, CCl_3F, CCl_2F_2, $CClF_3$, $CBrF_3$, CF_4, $CHCl_2F$, $CHClF_2$, CHF_3, $C_2Cl_4F_2$, $C_2Cl_3F_3$, $C_2Cl_2F_4$, $C_2Br_2F_4$, C_2ClF_5, C_2F_6, $C_2H_4F_2$, $C_2H_2F_4$, and mixtures thereof.

16. The heat transfer fluid mixture of claim 1 wherein each of the at least one heavy gases has molecular weight at least five times that of each of the at least one light gas.

17. The heat transfer fluid mixture of claim 15 wherein the at least one light gas has a concentration ranging from about 20 mole percent to about 99 mole percent.

18. The heat transfer fluid mixture of claim 15 wherein the at least one light gas has a concentration ranging from about 30 mole percent to about 98 mole percent.

19. The heat transfer fluid mixture of claim 15 wherein the at least one light gas has a concentration ranging from about 40 mole percent to about 97 mole percent.

20. A method of cooling an item, the method comprising contacting the item with the mixture of claim 1, wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

21. A method of cooling an item, the method comprising contacting the item with the mixture of claim 2 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

22. A method of cooling an item, the method comprising contacting the item with the mixture of claim 3 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

23. A method of cooling an item, the method comprising contacting the item with the mixture of claim 4 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

24. A method of cooling an item, the method comprising contacting the item with the mixture of claim 5 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

25. A method of cooling an item, the method comprising contacting the item with the mixture of claim 6 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

26. A method of heating an item, the method comprising contacting the item with the mixture of claim 1 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

27. A method of heating an item, the method comprising contacting the item with the mixture of claim 2 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

28. A method of heating an item, the method comprising contacting the item with the mixture of claim 3 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

29. A method of heating an item, the method comprising contacting the item with the mixture of claim 4 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

30. A method of heating an item, the method comprising contacting the item with the mixture of claim 5 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

31. A method of heating an item, the method comprising contacting the item with the mixture of claim 6 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

32. A method of cooling an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 1 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

33. A method of cooling an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 2 wherein said contacting is

selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

34. A method of cooling an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 3 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

35. A method of cooling an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 4 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

36. A method of cooling an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 5 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

37. A method of cooling an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 6 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

38. A method of heating an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 1 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

39. A method of heating an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 2 wherein said contacting is

selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

40. A method of heating an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 3 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

41. A method of heating an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 4 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

42. A method of heating an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 5 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

43. A method of heating an item traversing through a substantially confined space, the method comprising contacting the item with the mixture of claim 6 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

44. A method of cooling a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 1 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

45. A method of cooling a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the

mixture of claim 2 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

46. A method of cooling a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 3 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

47. A method of cooling a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 4 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

48. A method of cooling a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 5 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

49. A method of cooling a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 6 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

50. A method of heating a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 1 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

51. A method of heating a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the

mixture of claim 2 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

52. A method of heating a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 3 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

53. A method of heating a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 4 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

54. A method of heating a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 5 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

55. A method of heating a substantially cylindrical item traversing through a substantially confined space, the method comprising contacting the substantially cylindrical item with the mixture of claim 6 wherein said contacting is selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof.

56. A method of cooling a substantially cylindrical optical fiber traversing through a heat exchanger, the method comprising directly contacting the optical fiber with the mixture of claim 1.

57. A method of cooling a substantially cylindrical optical fiber traversing through a heat exchanger, the method comprising directly contacting the optical fiber with the mixture of claim 2.

58. A method of cooling a substantially cylindrical optical fiber traversing through a heat exchanger, the method comprising directly contacting the optical fiber with the mixture of claim 3.

59. A method of cooling a substantially cylindrical optical fiber traversing through a heat exchanger, the method comprising directly contacting the optical fiber with the mixture of claim 4.

60. A method of cooling a substantially cylindrical optical fiber traversing through a heat exchanger, the method comprising directly contacting the optical fiber with the mixture of claim 5.

61. A method of cooling a substantially cylindrical optical fiber traversing through a heat exchanger, the method comprising directly contacting the optical fiber with the mixture of claim 6.

62. A method of improving the cooling of a substantially cylindrical optical fiber traversing through a heat exchange device, the method comprising the steps of directly contacting the optical fiber with a heat transfer fluid mixture consisting essentially of at least one light gas and at least one heavy gas, and making an adjustment (either intermittently or continuously) of a parameter during the cooling, the parameter selected from the group consisting of composition of the heat transfer fluid mixture, flow rate of the heat transfer fluid mixture into the heat exchange device, an amount of heat transfer fluid mixture contacting the fiber in counter-current fashion, an amount of heat transfer fluid mixture contacting the fiber in co-current fashion, composition of the heat transfer fluid mixture contacting the fiber in counter-current fashion, composition of the heat transfer fluid mixture contacting the fiber in co-current fashion, a temperature of the heat transfer fluid mixture being injected into the heat exchange device, a temperature of the heat transfer fluid mixture before contacting the fiber in counter-current fashion, a temperature of the heat transfer fluid mixture during contacting the fiber in counter-current fashion, a temperature of the heat transfer fluid mixture after contacting the fiber in counter-current fashion, a temperature of the heat transfer fluid

mixture before contacting the fiber in a co-current fashion, a temperature of the heat transfer fluid mixture during contacting the fiber in a co-current fashion, a temperature of the heat transfer fluid mixture after contacting the fiber in a co-current fashion, a pressure of the heat transfer fluid mixture injected into the heat exchange device, a pressure of the heat transfer fluid mixture contacting the fiber in countercurrent fashion, and a pressure of the heat transfer fluid mixture contacting the fiber in a co-current fashion.

63. A method of improving cooling of an object in contact with a stagnant or flowing gas mixture in a confined space, the method comprising contacting the object with a heat transfer fluid mixture consisting essentially of at least one light gas and at least one heavy gas, the contacting being selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof, and making an adjustment either intermittently or continuously of a parameter during the cooling process, the parameter selected from the group consisting of a composition of the heat transfer fluid mixture, a flow rate of the heat transfer fluid mixture in contact with the object, an amount of heat transfer fluid mixture contacting the object, a composition of the heat transfer fluid mixture contacting the object, a temperature of the heat transfer fluid injected into the confined space, a temperature of the heat transfer fluid mixture before contacting the object, a temperature of the heat transfer fluid mixture during contacting the object, a temperature of the heat transfer fluid mixture after contacting the object, a pressure of the heat transfer fluid mixture entering the confined space, and a pressure of the heat transfer fluid mixture contacting the object.

64. The method of claim 63 wherein said parameter adjustment is made automatically or manually based upon a measured parameter of the object that changes during the cooling process.

65. A method of improving heating of an object in contact with a stagnant or flowing gas mixture in a confined space, the method comprising contacting the object with a heat transfer fluid mixture consisting essentially of at least one light gas and at least one heavy gas, the contacting being selected from the group consisting of directly contacting, indirectly contacting, and combinations thereof, and making an adjustment either intermittently or

continuously of a parameter during the heating process, the parameter selected from the group consisting of a composition of the heat transfer fluid mixture, a flow rate of the heat transfer fluid mixture in contact with the object, an amount of heat transfer fluid mixture contacting the object, a composition of the heat transfer fluid mixture contacting the object, a temperature of the heat transfer fluid injected into the confined space, a temperature of the heat transfer fluid mixture before contacting the object, a temperature of the heat transfer fluid mixture during contacting the object, a temperature of the heat transfer fluid mixture after contacting the object, a pressure of the heat transfer fluid mixture entering the confined space, and a pressure of the heat transfer fluid mixture contacting the object.

66. The method of claim 65 wherein said parameter adjustment is made automatically or manually based upon a measured parameter of the object that changes during the heating process.

67. A method of making a heat transfer fluid, the heat transfer fluid adjustable between a first composition having high heat transfer coefficient and high cost of use, and a second composition having essentially the same heat transfer coefficient as the first composition but allowing reduced cost of use, the method comprising the steps of:

68. providing at least one light gas from a light gas source;

69. providing at least one heavy gas from a heavy gas or fluid source;

70. ascertaining a heating or cooling demand;

71. combining the at least one light gas and the at least one heavy gas or fluid based on said demand.

72. The method of claim 67 wherein said demand is a cooling demand.

73. The method of claim 67 wherein said demand is a heating demand.

74. The method of claim 67 wherein each of the at least one heavy gases has a molecular weight at least two times that of each of the at least one light gas.

75. The method of claim 67 wherein said light gas is selected from the group consisting of hydrogen, helium, and any mixture thereof, and the heavy gas is selected from the group consisting of argon, any single fluid heavier than helium, and any mixture of fluids heavier than helium.

76. The method of claim 67 wherein the at least one heavy gas is selected from the group consisting of N_2, O_2, F_2, Ne, Cl_2, Ar, Br_2, Kr, Xe, Rn, CH_4, C_2H_4, C_2H_6, C_3H_8, C_3H_6, C_4H_{10}, $(CH_3)_3CH$, NH_3, CO, CO_2, CCl_4, CH_3Cl, SO_2, SO_3, NO, NO_2, N_2O, CCl_3F, CCl_2F_2, $CClF_3$, $CBrF_3$, CF_4, $CHCl_2F$, $CHClF_2$, CHF_3, $C_2Cl_4F_2$, $C_2Cl_3F_3$, $C_2Cl_2F_4$, $C_2Br_2F_4$, C_2ClF_5, C_2F_6, $C_2H_4F_2$, $C_2H_2F_4$, and mixtures thereof.